



Doc. Number :

- ☐ Tentative Specification
☐ Preliminary Specification
☒ Approval Specification

MODEL NO.: M236H3
SUFFIX: LA3

Customer: Common Model**APPROVED BY****SIGNATURE****Name / Title** _____

Note

Product Version C1/C2

Please return 1 copy for your confirmation with your signature and comments.

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**REVISION HISTORY**

Version	Date	Section	Description
3.0	Oct.13.2010	All	Approval Specification was first issued.
3.1	Oct.27.2010	2	Weight: Typ: 2750 -> 2510 Max: 2800 -> 2610
		4.3.1	Power Supply Current/White: Typ: 0.39 -> 0.41 Max: 0.48 -> 0.53
3.2	Mar.21.2011	4.3.3	Remove description "LED light bar circuit is (9)Series, (8)Parallel"
		8	Source/Gate driver IC code: add ILITEK=Q, Fiti=Y, None IC =Z
			Cell location: add Hsinchu Taiwan=SC
			Module location: add Shenzhen China=SH
3.3	May.03.2011	4.3.1	Note(3) Fr = 60Hz -> Fr = 75Hz
		4.3.4	Add LED light bar connector drawing
3.4	August.03.2011	2	Add Module Size/ Thickness (T)/Min.
		3.2.2	LED Reverse Voltage Per Input Pin/Max: 60->45
3.5	October.05.2011	Appendix	Pattern Change to U Type : PCBA Cover for VR Position



1. GENERAL DESCRIPTION

1.1 OVERVIEW

M236H3-LA3 is a 23.6" TFT Liquid Crystal Display module with WLED Backlight unit and 30 pins 2ch-LVDS interface. This module supports 1920 x 1080 Full HD mode and can display up to 16.7M colors. The converter module for Backlight is not built in.

1.2 GENERAL SPECIFICATIONS

Item	Specification	Unit	Note
Screen Size	23.547" real diagonal		
Driver Element	a-si TFT active matrix	-	-
Pixel Number	1920 x R.G.B. x 1080	pixel	-
Pixel Pitch	0.2715 (H) x 0.2715 (V)	mm	-
Pixel Arrangement	RGB vertical stripe	-	-
Display Colors	16.7M	color	-
Transmissive Mode	Normally white	-	-
Surface Treatment	AG type, 3H hard coating, Haze 25	-	-
Luminance, White	300	Cd/m2	
Color Gamut	72% of NTSC(Typ.)	-	
TCO	TCO 5.0 compliance	-	
Power Consumption	Total 18.95W(Max.)@cell 6.35W (Max.), BL 12.60W (Max.)		(1)

Note (1) The specified power consumption : Total= cell (reference 4.3.1)+BL (reference 4.3.3)

2. MECHANICAL SPECIFICATIONS

Item		Min.	Typ.	Max.	Unit	Note
Module Size	Horizontal (H)	544.3	544.8	545.3	mm	(1)
	Vertical (V)	320.0	320.5	321.0	mm	
	Thickness (T)	10.9	11.4	11.9	mm	
Bezel Area	Horizontal	525.07	525.22	525.37	mm	
	Vertical	297.07	297.22	297.37	mm	
Active Area	Horizontal	-	521.28	-	mm	
	Vertical	-	293.22	-	mm	
Weight		-	2510	2610	g	

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

3. ABSOLUTE MAXIMUM RATINGS

3.1 ABSOLUTE RATINGS OF ENVIRONMENT

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Storage Temperature	TST	-20	60	°C	(1)
Operating Ambient Temperature	TOP	0	50	°C	(1), (2)

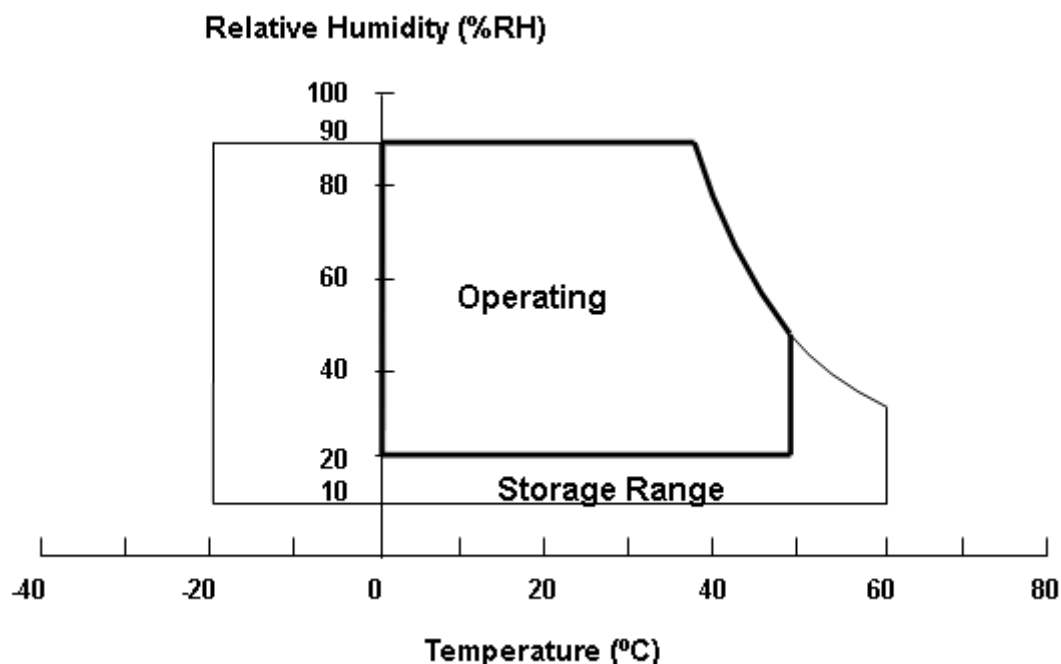
Note (1)

(a) 90 %RH Max. (Ta <= 40 °C).

(b) Wet-bulb temperature should be 39 °C Max. (Ta > 40 °C).

(c) No condensation.

Note (2) The temperature of panel surface should be 0 °C min. and 60 °C max.



3.2 ELECTRICAL ABSOLUTE RATINGS

3.2.1 TFT LCD MODULE

Item	Symbol	Value		Unit	Note
		Min.	Max.		
Power Supply Voltage	VCCS	-0.3	6.0	V	(1)
Logic Input Voltage	V _{IN}	-0.3	3.6	V	

3.2.2 BACKLIGHT UNIT

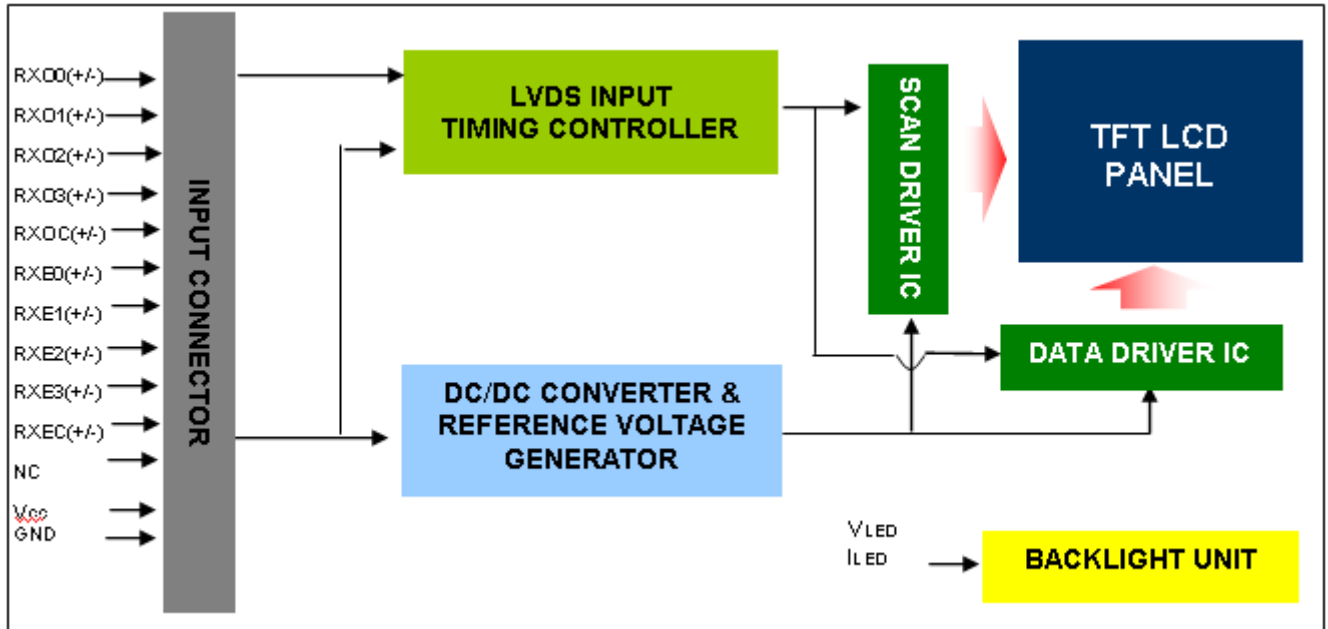
Item	Symbol	Value			Unit	Note
		Min.	Typ	Max.		
LED Forward Current Per Input Pin	I _F	0	50	56	mA	(1), (2) Duty=100%
LED Reverse Voltage Per Input Pin	V _R	---	---	45	V	
LED Pulse Forward Current Per Input Pin	I _P	---	---	160	mA	(1), (2) Pulse Width ≤ 10msec. and Duty ≤ 10%

Note (1) Permanent damage to the device may occur if maximum values are exceeded. Function operation should be restricted to the conditions described under Normal Operating Conditions.

Note (2) Specified values are for input pin of LED light bar at Ta=25±2 °C (Refer to 4.3.3 and 4.3.4 for further information).

4. ELECTRICAL SPECIFICATIONS

4.1 FUNCTION BLOCK DIAGRAM



4.2. INTERFACE CONNECTIONS

PIN ASSIGNMENT

Pin	Name	Description
1	RXO0-	Negative LVDS differential data input. Channel O0 (odd)
2	RXO0+	Positive LVDS differential data input. Channel O0 (odd)
3	RXO1-	Negative LVDS differential data input. Channel O1 (odd)
4	RXO1+	Positive LVDS differential data input. Channel O1 (odd)
5	RXO2-	Negative LVDS differential data input. Channel O2 (odd)
6	RXO2+	Positive LVDS differential data input. Channel O2 (odd)
7	GND	Ground
8	RXOC-	Negative LVDS differential clock input. (odd)
9	RXOC+	Positive LVDS differential clock input. (odd)
10	RXO3-	Negative LVDS differential data input. Channel O3(odd)
11	RXO3+	Positive LVDS differential data input. Channel O3 (odd)
12	RXE0-	Negative LVDS differential data input. Channel E0 (even)
13	RXE0+	Positive LVDS differential data input. Channel E0 (even)
14	GND	Ground
15	RXE1-	Negative LVDS differential data input. Channel E1 (even)
16	RXE1+	Positive LVDS differential data input. Channel E1 (even)
17	GND	Ground
18	RXE2-	Negative LVDS differential data input. Channel E2 (even)
19	RXE2+	Positive LVDS differential data input. Channel E2 (even)
20	RXEC-	Negative LVDS differential clock input. (even)
21	RXEC+	Positive LVDS differential clock input. (even)
22	RXE3-	Negative LVDS differential data input. Channel E3 (even)
23	RXE3+	Positive LVDS differential data input. Channel E3 (even)
24	GND	Ground
25	NC	For LCD internal use only, Do not connect

Pin	Name	Description
26	NC	For LCD internal use only, Do not connect
27	NC	For LCD internal use only, Do not connect
28	Vcc	+5.0V power supply
29	Vcc	+5.0V power supply
30	Vcc	+5.0V power supply

Note (1) Connector Part No.:

093G30-B2001A-G4(STARCONN) or 187098-30091 (P-TWO) or equivalent

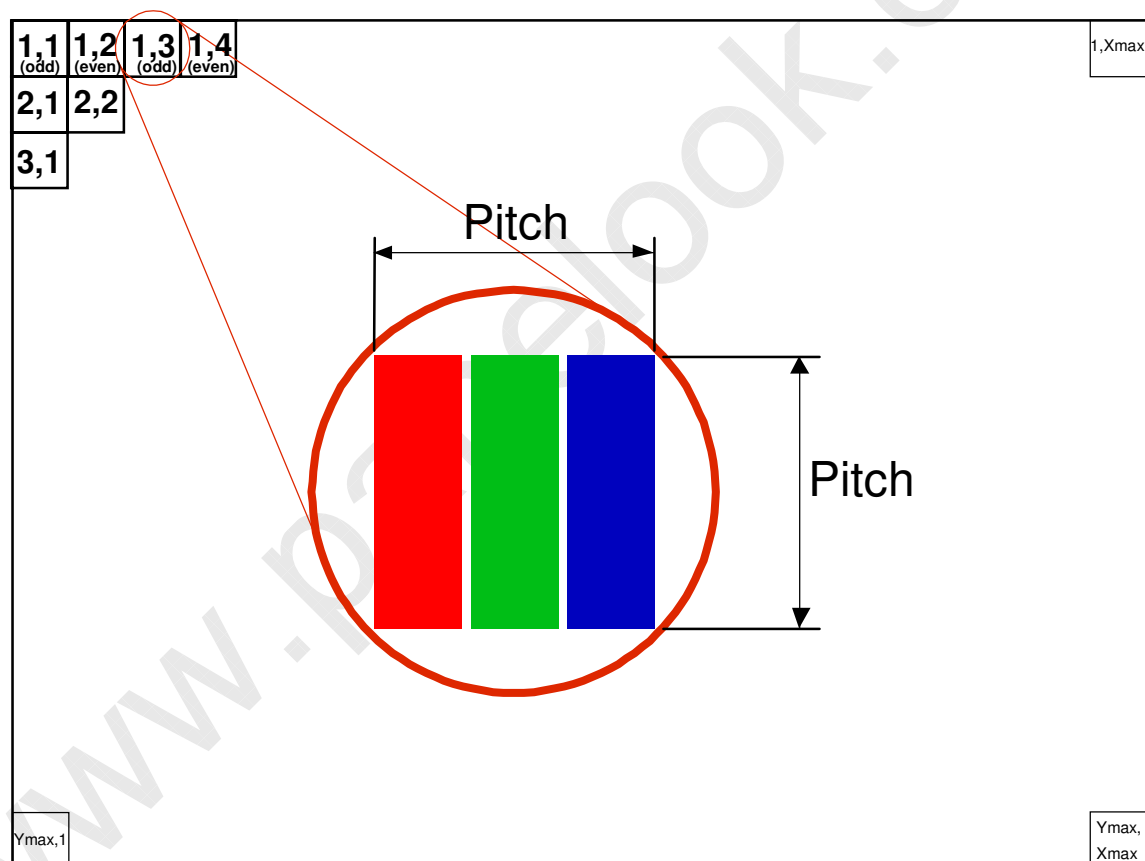
Note (2) User's connector Part No:

Mating Wire Cable Connector Part No.: FI-X30H(JAE) or FI-X30HL(JAE)

Mating FFC Cable Connector Part No.: 217007-013001 (P-TWO) or JF05X030-1 (JAE).

Note (3) The first pixel is odd.

Note (4) Input signal of even and odd clock should be the same timing.



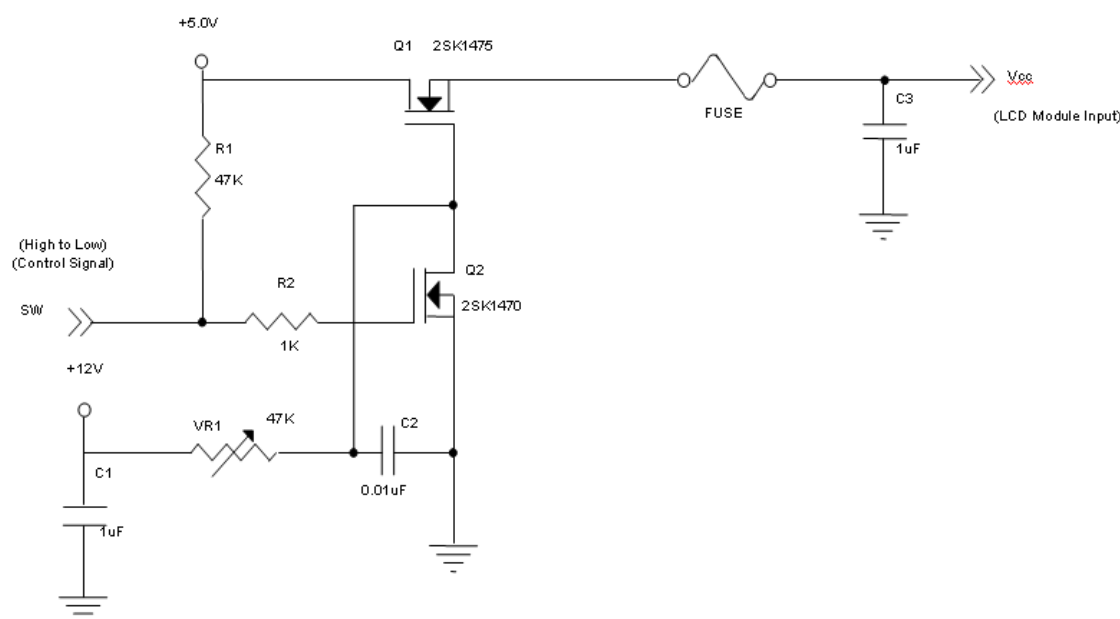
4.3 ELECTRICAL CHARACTERISTICS

4.3.1 LCD ELETRONICS SPECIFICATION

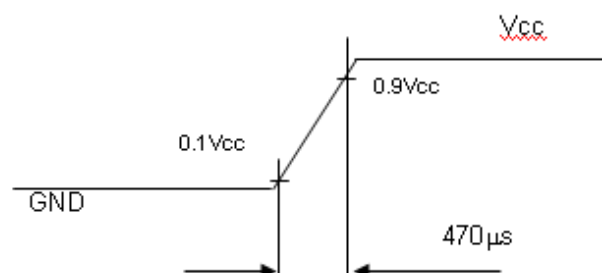
Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
Power Supply Voltage	V _{CC}	4.5	5.0	5.5	V	-
Ripple Voltage	V _{RP}	-	-	300	mV	-
Rush Current	I _{RUSH}	-	1.52	3	A	(2)
Power Supply Current	White	-	0.39	0.48	A	(3)a
	Black	-	0.98	1.27	A	(3)b
	Vertical Stripe	-	0.95	1.27	A	(3)c
Power Consumption	PLCD	-	4.9	6.35	Watt	(4)
LVDS differential input voltage	V _{id}	200	-	600	mV	
LVDS common input voltage	V _{ic}	1.0	1.2	1.4	V	
Logic High Input Voltage	V _{IH}	2.64	-	3.6	V	
Logic Low Input Voltage	V _{IL}	0	-	0.66	V	

Note (1) The ambient temperature is $T_a = 25 \pm 2$ °C.

Note (2) Measurement Conditions:



V_{CC} rising time is 470μs



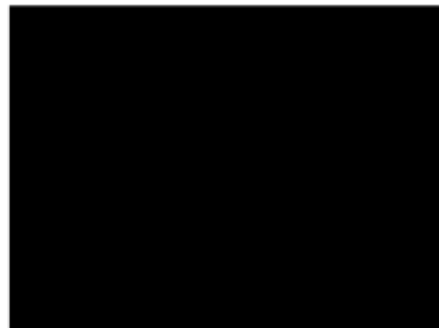
Note (3) The specified power supply current is under the conditions at $V_{cc} = 5.0\text{ V}$, $T_a = 25 \pm 2\text{ }^{\circ}\text{C}$, $F_r = 75\text{ Hz}$, whereas a power dissipation check pattern below is displayed.

a. White Pattern



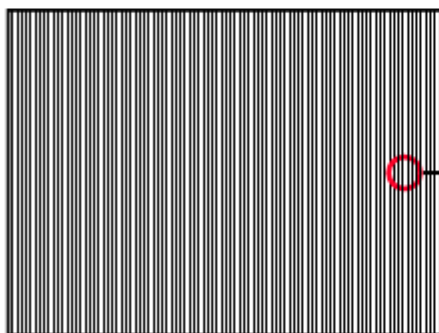
Active Area

b. Black Pattern

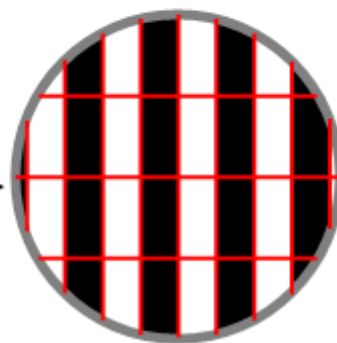


Active Area

c. Vertical Stripe Pattern

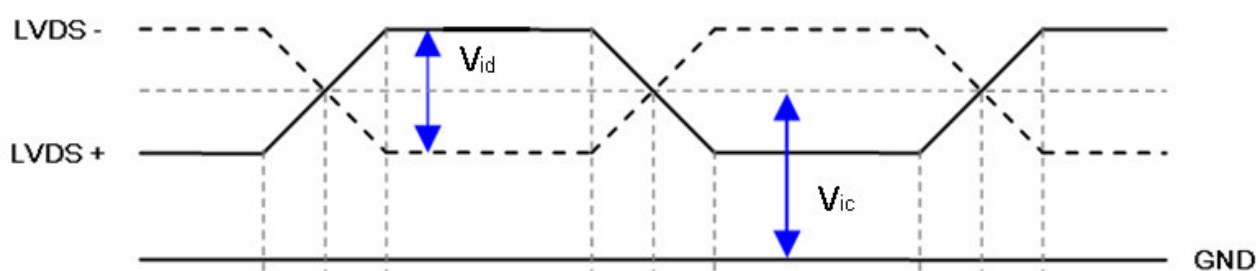


Active Area

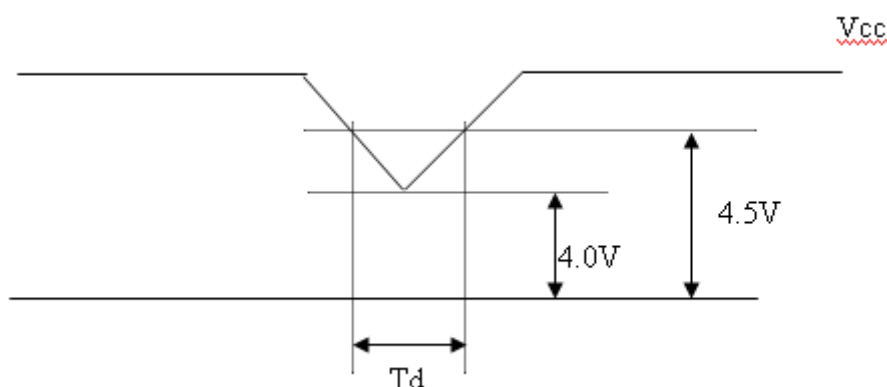


Note (4) The power consumption is specified at the pattern with the maximum current.

Note (5) VID waveform condition



4.3.2 Vcc Power Dip Condition



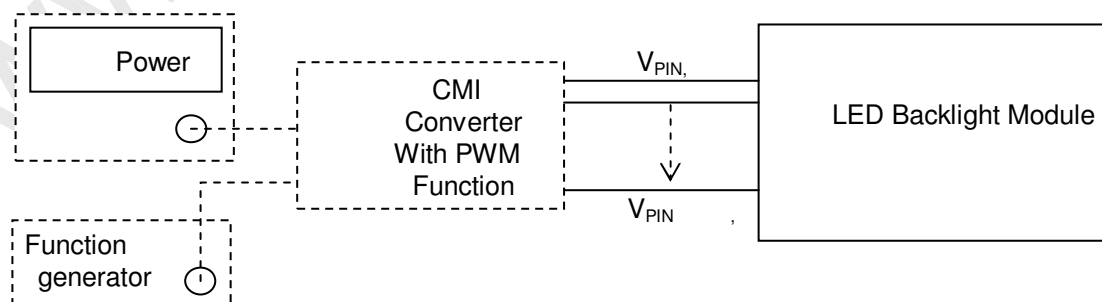
4.3.3 BACKLIGHT UNIT

Parameter	Symbol	Value			Unit	Note
		Min.	Typ.	Max.		
LED Light Bar Input Voltage Per Input Pin	VPIN	26.1	28.8	31.5	V	(1), Duty=100%, IPIN=50mA
LED Light Bar Current Per Input Pin	IPIN	0	50	56	mA	(1), (2) Duty=100%
LED Life Time	LLED	30000			Hrs	(3)
Power Consumption	PBL	---	11.52	12.6	W	(1) Duty=100%, IPIN=50mA

Note (1) LED light bar input voltage and current are measured by utilizing a true RMS multimeter as shown below:

Note (2) $PBL = IPIN \times VPIN \times (8)$ input pins.

Note (3) The lifetime of LED is defined as the time when LED packages continue to operate under the conditions at $T_a = 25 \pm 2^\circ\text{C}$ and $I = (25)\text{mA}$ (per chip) until the brightness becomes $\leq 50\%$ of its original value.



4.3.4 LIGHTBAR Connector Pin Assignment

Connector: 7083K-F12N-00L, (Entery) or Compatible

